

# Cholera: An Update From Post-Earthquake Haiti

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## Abstract

It has been a little over a year since an earthquake decimated the already weak and fragile infrastructure of Haiti. An estimated 250,000 people died, 300,000 were injured, and 1.3 million people were left homeless.<sup>1</sup> As relief shelters emerged in Port-au-Prince, the World Health Organization warned about the likelihood of disease outbreaks on an epidemic proportion. Since then, an infection that most healthcare personnel have only read about in text books has emerged in an unexpected area of Haiti.

Cholera, an acutely dehydrating diarrheal disease that can quickly become fatal, is caused by the gram negative bacterium, *Vibrio cholerae*.<sup>2</sup> It is usually spread through contaminated water during times when there is a sudden change in the balance between functional hygiene/sanitation services and the population density.<sup>3</sup> In the case of Haiti, however, the first cases occurred in rural area 55 miles from the nearest camps along the coastal city of Saint Marc.<sup>1</sup>

On October 20<sup>th</sup>, sixty cases of profuse watery diarrhea were recorded at L'Hospital de Saint Nicolas. Within the next forty eight hours, over 1,500 patients reported to the hospital with acute symptoms and laboratory confirmation occurring the following day.<sup>1</sup> Within two months, cholera struck all provinces of the country and killed more than 3,600 patients as of December 31, 2010.<sup>1</sup> Experts believe that the disease was spread to Port-au-Prince by a large river that runs through the Artibonite region, but research shows that the first cholera strain seen in Haiti in more than a century was imported from south east Asia by human means.

According to Chin et al, the Haitian epidemic of cholera was sequenced as V. *Cholerae* El Tor 01 strain which was previously isolated in Bangladesh in 2002 and 2008.<sup>4</sup> Unfortunately, the El Tor 01 strain is associated with increased antibiotic resistance, increased virulence, and an enhanced ability to survive in both the environment and the host.<sup>4</sup> Even more worrisome is that this accidental

introduction may displace the resident El Tor 01 seventh-pandemic strains in Latin America.<sup>4</sup> Due to both apparent local and worldwide implications, Chin et al and Nelson et al called for the possibility of preventing the spread by increasing the amount of vaccines and also adjusting the treatment for cholera.<sup>4,5</sup>

Currently, the world health organization only recommends antibiotic treatment for those with severe cholera (characterized by greater than 10% dehydration) and aggressive rehydration following a strict protocol for all other forms.<sup>5</sup> However, the International Centre for Diarrhoeal Disease Research recommends antibiotics for both moderate and severe cases (characterized by some dehydration with persistent diarrhea) while also following the rehydration protocol. The strain in Haiti is currently sensitive to tetracycline and azithromycin but resistant to nalidixic acid, sulfisoxazole and trimethoprim-sulfamethoxazole.<sup>5</sup>

The duration of exertion of V. *cholerae* in the stools is decreased to one or two days with appropriate antibiotic therapy but lasts five or more days in those receiving no treatment.<sup>5</sup> In addition, both the purging rate and the illness duration are shortened by 50%.<sup>5</sup> Further research has also shown that an early antibiotic approach can maximize limited resources by reducing the need for nursing care and earlier disposition from treatment centers.<sup>5</sup>

In response to these new recommendations, the Haitian Ministry of Public Health and Population (MSPP) has developed a nationwide surveillance system that tracks the epidemic which allows for proper resource management.<sup>6</sup> With an increase in healthcare education, antimicrobial agents for all hospitalized patients and vaccinations in the Artibonite region, mortality has dropped to the international standard of 1%.<sup>6</sup> This improvement in mortality could be directly related to the MSPP urging continued microscopy

use as well as rapid tests at peripheral sites for rapid diagnosis and treatment.<sup>6</sup>

Although there has been a decline in cholera prevalence in early 2011, several researchers feel that this is part of the natural course of the epidemic and should not be interpreted as indicative of successful intervention. Andrews et al. project through an epidemic model that there will be 779,000 new cases of cholera in Haiti and 11,100 deaths between March 1 and Nov 30, 2011.<sup>7</sup>

In summary, post-earthquake Haiti is facing an epidemic that most healthcare professionals have not seen in more than a century. Despite the long odds, a nation has rallied around its infrastructure and found ways to bring healthcare to their people. Only the future can tell whether this epidemic can be controlled or if it will be transported to other Caribbean countries much like it was transported to Haiti.

### **References**

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